



## PARKS, RECREATION AND COMMUNITY SERVICES DEPARTMENT SAFETY POLICY

POLICY NUMBER: <b>21</b>	DATE: November 24, 2000
TITLE: <b>TRAFFIC CONTROL</b>	APPROVED BY: Katherine Boxer Latipow

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### 21-1. REFERENCE

- (a) Division 12, Section 25301, California Vehicle Code
- (b) Title 8, California Code of Regulations, Chapter 4, Subchapter 4, Section 1597 - 1599
- (c) Manual of Traffic Controls for Construction and Maintenance Work Zones - 1990

21-2. **POLICY**

- (a) Where a hazard exists to employees because of traffic or haulage conditions at work sites that encroach upon public streets or highways, a system of traffic controls in conformance with the California Department of Transportation *Manual of Traffic Controls for Construction and Maintenance Work Zones - 1990* shall be followed to abate the hazard. Work crews whose duties encroach upon public streets or highways must have a copy of the manual and this policy at the worksite.
- (b) Additional means of traffic control, such as continuous patrol, detours, barricades, or other techniques for the safety of employees may be employed.
- (c) This policy shall be incorporated by reference in contracts for services.

21-3. **SPECIAL WORK RULES**

(a) Warning Lights and Devices

- (1) When vehicles are parked, stopped or standing in roadway, shoulder or in close proximity to the road shall display warning devices as follows:
  - (A) During daylight warning devices shall consist of either:
    - 1 A warning flag or barricade stripping on the front and rear end of the vehicle.
    - 2 A warning flag, sign, or barrier on the highway not more than 50 feet in advance of the vehicle and not more than 50 feet to the rear thereof, except that in zones where the speed limit is in excess of 25 miles per hour the 50 foot distance may be increased up to 500 feet from the vehicle as circumstances may warrant.
  - (B) During darkness the warning devices shall consist of either:
    - 1 One or more flashing amber warning lights on the vehicle giving warning to approaching traffic from each direction.
    - 2 A warning light, flare, or reflector on the highway not more than 50 feet in advance of the vehicle and not more than 50 feet to the rear thereof, except that in zones where the speed limit is in excess of 25 miles per hour where the 50 foot distance may be

increased up to 500 feet from the vehicle where circumstances may warrant.

- (C) The provisions above do not prevent the display of both types of warning devices during daylight or darkness.
  - (D) During either daylight or darkness, no warning device is necessary if the vehicle is equipped with flashing warning lights visible to approaching traffic from each direction.
  - (E) Employees (on foot) exposed to the hazard of vehicular traffic shall wear orange warning garments such as vests, jackets, or shirts. During rainy weather, employees exposed to the hazard of vehicular traffic may wear orange or yellow rainwear.
- (1) During hours of darkness, warning garments shall be outfitted with reflectorized material. The reflective material shall be either orange, white (including silver-colored reflective coatings or elements that reflect white light), yellow, fluorescent red-orange, or fluorescent yellow-orange.
- (b) Flaggers
    - (1) Flaggers shall be utilized at locations on a construction site where barricades and warning signs cannot control the moving traffic.
    - (2) When flaggers are required, they shall be placed in relation to the equipment or operation so as to give effective warning.
    - (3) Flaggers exposed to the hazard of vehicular traffic shall wear orange warning garments such as vests, jackets, or shirts. During rainy weather, employees exposed to the hazard of vehicular traffic may wear orange or yellow rainwear.
- (c) Training
    - (1) Flaggers shall be trained in the proper fundamentals of flagging moving traffic before being assigned as flaggers.
    - (2) Employees participating in setting up traffic control devices shall be trained in the proper methods of establishing traffic controls as outlined in *Manual of Traffic Controls for Construction and Maintenance Work Zones - 1990* and this policy.

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- (d) Specific Work Zone Traffic Control Measures Not Listed in the *Manual of Traffic Controls for Construction and Maintenance Work Zones - 1990*
  - (1) The *Manual of Traffic Controls for Construction and Maintenance Work Zones - 1990* does not contain many of the types of traffic controls needed for the types of work that is accomplished by the Department. To aid in implementation of work zone procedures
  - (2) Appendix A contains the traffic control procedures for work not covered by the *Manual of Traffic Controls for Construction and Maintenance Work Zones - 1990*.

## APPENDIX A Parks Traffic Controls

### A-1. DEFINITIONS

(CALTRANS, Chapter 8, Protection of Workers, Division of Maintenance)

- (a) **Moving Operation.** A moving operation is any work activity that moves along the traveled way slower than the prevailing speed of traffic with occasional stops of 10 minutes or less. Some examples are striping, sweeping, etc.
- (b) **Short-Term Operation.** A short-term operation is any work activity that can be performed in 10 minutes or less during light traffic volumes, without interfering with traffic or placing the employee in jeopardy. Some examples are pavement patching, removing a large piece of debris, etc.
- (c) **Stationary Operation.** A stationary operation is any work activity on foot or equipment occupying any part of a paved shoulder or the traveled way at one location for more than 10 minutes.

### A-2. SAFETY

- (a) Safety is achieved by three basic requirements:
  - (1) Warning the driver in advance of the work area.
  - (2) The visibility and protection of the work area itself
  - (3) And the directions to the motorists.
- (b) Who is responsible for seeing that these minimum requirements are met?
  - (1) The initial responsibility lies with the City since it has authority over the roadway. This is generally part of the planning stage.
  - (2) Then the Division doing the work and the organization having the work does have responsibility.
  - (3) Once the work begins, each and every worker enters the safety picture. Not only will he often be called upon to install traffic control devices or to do flagging, but he owes it to himself to see that he is properly protected at all times.

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- (4) The final and most important responsibility lies with the crew leader. The buck stops here. At any work site the person in charge of the operation has the final responsibility for the safety of his workers and the motorists on the roadway.
- (c) In every situation this responsibility starts with basic protection, both workers and equipment must be easily recognized by the motorist.
  - (1) Anyone working on or near any roadway should wear safety clothing. The most common safety clothing is the orange safety vest.
  - (2) We also recommend all maintenance and construction workers to wear a hard hat to protect them from flying objects thrown by passing traffic.
  - (3) Workers can also protect themselves by facing traffic whenever possible. The worker who faces traffic has the chance to look up and see an approaching car and get out of the way. But the worker who turns his back on traffic may never know what hit him.
  - (4) And workers should be further protected. By proper placement of their own work vehicles. Whenever possible, trucks and other equipment should be parked so that they are as far from traffic as the work area. If the work area is on the roadway itself, equipment should be in the lane that is closed.
  - (5) Equipment must also be easily recognized. For the protection of both the motorist and the equipment itself. Flashing yellow lights should be mounted high on the vehicle for maximum visibility both by day and by night. And they must always be in working order. Check the daily before beginning work.
  - (6) Since construction and maintenance equipment is designed more for work than for travel, the slow-moving vehicle emblem must be clearly displayed on all equipment that is designed to operate at slow speeds.

### **A-3. WORK SITUATIONS**

- (a) All work situations have six variables:
  - (1) The type of work to be done.
  - (2) The location of the work in relation to the roadway.
  - (3) The amount of time needed to complete the work.

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- (4) The type of roadway involved.
- (5) The speed of traffic.
- (6) The volume of traffic.
- (b) Combinations of these factors create too many situations to cover individually. So we will use these variables as guidelines for the use of traffic control devices.

### A-4. DISTANCE FROM TRAFFIC

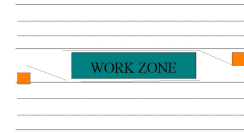
- (a) First you should ask yourself, where must the work be done? It may be well off the roadway, let's say 15 feet or more. Or it may be just off the shoulder in the recovery area or on the shoulder itself. If it's on the roadway, it may involve the entire roadway an outer or exterior lane, or a middle isolated lane. Or it may be on the median of a divided roadway.
- (b) As a general rule, the closer the work is to traffic, more traffic control devices are needed. For example, if the work is 15 or more feet from the edge of the shoulder, and is limited to that area, no special traffic control is needed. Any work area signs, cones or other devices would only slow and disrupt traffic unnecessarily and the motorist would then tend to ignore such devices where they are needed. But what if haul trucks or other equipment occasionally move closer to the roadway? The motorist should at least be warned by a sign, such as Road Machinery Ahead.
- (c) Some operations, such as mowing, require work to be done right up to the edge of the shoulder. Or, where there is no shoulder on the roadway itself. This area is part of the motorist recover area. So warning signs need to tell motorists that there are workers or equipment near the roadway.
- (d) Work on the shoulder is even closer to the traffic and requires more traffic control. The shoulder is intended as a recovery area and an emergency stopping place for motorists. So traffic should not only be warned of the work by signs but also by cones, drums or barricades to block traffic from entering the work area. Remember, the motorist uses the shoulder as part of the roadway. So care should be taken to make any work area on the shoulder highly visible. The same thing applies to work on the interior shoulders of divided roads.



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### A-5. MEDIAN ISLANDS

- (a) When work is required on medians of divided roadways, traffic control must be applied to both directions of traffic.
- (b) Where medians are narrow (less than three feet wide), additional advance signs and channelization will be needed. Since the workers are isolated between two directions of traffic. You will need to go one step further and close one lane of traffic in each direction next to the median.



### A-6. WORK ON THE ROADWAY

- (a) Whenever operations must be performed on the roadway itself, there must be maximum protection for the worker and warning for the motorist. Here's a good point to remember, when in doubt plan for maximum protection.
- (b) How can we get this protection? Let's start by warning the motorist well in advance of the work area. Advance warning signs not only must warn the motorist of road work in general, but they should also warn them of specific hazards.
- (c) And, channelizing devices not only separate traffic from the work area, but also guide traffic into open lanes ahead of the work area. If the work is on an outer or exterior lane, channelization is needed only on the one side. And advance signing is placed on the same side of the roadway as the work area.
- (d) But, if the work is in the interior or isolated lane of a divided roadway or one way street, channelizing devices are needed on both sides of the work area and advance signing must be repeated on each side of the roadway.
- (e) Another isolated situation would be on an interior lane of any two-way undivided roadway. Cones or other closure devices are still needed on both sides of the work area. But in this situation, advance signing must be placed for both directions of traffic.

### A-7. MOVING OPERATIONS

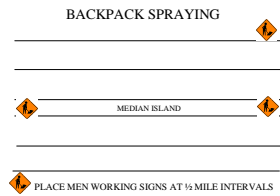
- (a) A moving operation is one that moves along the roadway at a steady rate, such as striping. Since these operations are constantly moving and can cover miles of roadway during a single work day, fixed signing and channelization may not be practical.
- (b) Some moving operations such as backpack spraying can be done in stages of one or two miles. These operations should still use appropriate advance warning signs. But when the work moves on to the next stage, the signs must also be moved. So truck mounted



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arrow boards or light bars are ideal for this type of operation.

One thing to remember, keep the advance warning close enough so the driver won't forget it and far enough in advance to give him adequate warning.



- (c) Other moving operations such as watering, striping, or spraying, may not be adaptable to staging. These operations can cover several miles of roadway in a few hours. So advance warning signs should move along with the operation. This may be accomplished by a truck displaying the appropriate warning signs and lights and trailing behind the operation or a warning sign visible on the truck.
- (d) And if the moving operation affects both directions of traffic as in centerline striping, the work vehicle should be behind a lead warning vehicle. The lead warning vehicle must also be equipped with the appropriate warnings and flashing high intensity lights.
- (e) Mobile short term operations like surveying, sign maintenance, limb removal, and joint sealing make frequent short stops along the roadway. These stops generally last 10 minutes or less. Since the time is so short, there may be a tendency to completely forget about traffic controls. But there are ways of warning traffic and they should be used.
- (f) In most mobile short term operations, shadow vehicles can be used to warn motorists and help guide them around the work.
- (g) If the work area is off the roadway like sign maintenance, or if a second vehicle is not available, the work vehicle should be parked between the work area and the traffic and provide adequate visibility of the work area.
- (h) Where mobile short term operations must be performed on the roadway, it may be necessary to spend more time installing the traffic control devices than doing the work itself. This is particularly true where traffic speed or volume is high. You still must make the operation safe. Take the extra time rather than cause an accident.

### A-8. STATIONARY OPERATIONS

- (a) Stationary operations include any work which requires 10 minutes or more at a single location. Stationary activities range from pavement repairs which can be completed in less than a day to major construction which would usually call for an overnight closure.
- (b) All stationary operations on or near the roadway, must have appropriate advance signing. For most temporary situations, these signs can be on portable or trailer mounts. But for

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more long-term operations, more permanent mountings may be needed to prevent wind damage and vandalism.

- (c) Stationary operations on the roadway or the should always be closed by traffic by means of channelizing devices before the work begins. If the work can be completed in one day, cones are the most commonly used channeling device.
- (d) But if the work area must be left overnight, cones can be stolen or knocked down by wind or traffic so drums or barricades should be used to channelize traffic and close the work area. Lights must also be added. Steady burning lights to outline the open roadway and flashing lights to warn the motorists of obstructions.
- (e) Even if the work area is just off the roadway, it is a good idea to use barricades to block it from traffic. Open excavation should be covered and barricaded all the way around to protect pedestrians as well as traffic. And, they should be properly lighted when left overnight.
- (f) You should also ask yourself what type of roadway is involved? It may be a one-way or two-way road. If its two-way it may be divided or undivided. It may be from one or more than four lanes wide, and it may have a shoulder, bicycle lane, or curb.
- (g) As mentioned earlier, if the roadway is one-way or half of a multi-lane divided roadway, advance warning signs should be placed on both sides of the approaching traffic.
- (h) And if the work affects both directions of traffic on a two-way roadway, advance warning must be installed for each direction of approaching traffic.
- (i) The number of lanes will also effect the traffic control. For example, closing one exterior lane of a four lane two-way road only affects one direction of traffic so advance warning is needed only for that one direction. But, a lane must be closed on a two-lane, two-way road. Both directions of traffic are affected.
- (j) The edge treatment of a roadway will also affect work area traffic control. If the roadway has a shoulder, work vehicles can be easily moved completely off the pavement for roadside work. Cones and/or barricades should also be used to completely protect the work area.
- (k) But if the edge of the roadway has a raised curb, removing a work vehicle from the roadway is more difficult. In some situations it may not be possible to remove a work vehicle from the roadway by jumping the curb. So the truck must be protected by vast signing and channelization. As if the work area itself were on the roadway.

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- (l) Some times it is necessary to use the shoulder to reroute traffic and create an additional lane. This can be particularly useful on a high volume roadway. But be sure the shoulder is wide enough and stable enough to handle the traffic flow.

### **A-9. TRAFFIC VOLUME**

- (a) Next, ask how much traffic is involved. Traffic volume is another important factor in work area traffic control. As a general rule, the greater the traffic volume, the greater the need for visibility of all control devices. For example, in low volume traffic, an approaching driver may not have any trouble seeing cones or a warning sign which is mounted one foot above the pavement.
- (b) But, on the same roadway in high volume traffic, other cars may block these devices from view. The motorist must then simply follow the leader and depend on the reactions of the drivers in front of him. This adds even more congestion to the disrupted high volume traffic. Here, high level devices should be used to show up over the tops of cars.
- (c) One solution to this problem lies in scheduling the work. The early morning and late afternoon rush hours should be avoided. It is strictly prohibited to close a traffic lane between 6:00 - 9:00 a.m. and 3:00 - 6:00 p.m. in the City. Where traffic volume remains heavy throughout the daylight hours, it may be necessary to schedule some operations, such as resurfacing, at night.
- (d) But remember, night operations may reduce the conflict with traffic volume, but they also reduce the visibility of the operation. So be sure that the operation and all control devices are properly reflectorized and lighted.
- (e) Sometimes it is impossible to schedule work around peak hours. If the work area must remain closed through rush hours, or if the roadway always has a relatively high volume of traffic, the problems of limited visibility and traffic congestion must be solved by other means.
- (f) Advance warning signs can be placed more effectively by repeating them in a series. This not only increases the opportunity for the driver to see the warning message but also increases the distance from the first advance warning sign to the work area.
- (g) A more effective step to increasing the visibility of signs for heavy traffic is to place the signs higher. Remember one foot from the pavement to the bottom of the sign is the minimum for signs placed on barricades or portable mounts. Whenever work area signs should be mounted as high as other traffic signs. At least 5 feet in rural areas and at least 7 feet in urban areas.

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- (h) Traffic volume should also be considered when selecting channelizing devices. Again, 18 inches is the minimum height for traffic cones, but it is recommended that you use higher cones or other devices where traffic volume is high. And flags can be placed in the tops of cones for greater visibility.

### A-10. TRAFFIC CONTROL DEVICES

- (a) Another possible solution would be to use barricades in place of cones. Since types I and II barricades are 3 to 3 ½ feet tall, they offer greater visibility in heavy traffic. And, they are still portable enough to be practical for operations which only last a few hours. These barricades may look narrow, but they are still more visible than cones, and they are the standard minimum of 2 feet in width.
- (b) The high level warning device is very effective in high volume situations. It stands 8 to 10 feet high and is placed just inside a lane closure to warn approaching traffic that the lane is closed. It can be mounted on its own stand, or on the back of a work vehicle. For night use, the flags can be replaced or emphasized by flashing yellow lights
- (c) The final question to be asked, is how fast is the traffic moving? As a general rule, the greater the speed of approaching traffic, the greater the size, number and spacing of control devices.
- (d) On high speed roads, such as limited access expressways, it may be desirable to use advance warning signs that are larger than the standard 48 by 48 inches. While slightly smaller warning signs may be adequate for low speed residential streets.
- (e) Traffic speed will also help determine where advance warning signs are placed. Advanced warning signs must always be placed far enough from the start of the work area to allow the motorist to react safely. But they should not be so far away that they will be forgotten before the motorist sees the work area. Meeting both of these requirements on a high speed roadway can be tricky.

MINIMUM RECOMMENDED DELINEATOR AND SIGN PLACEMENT				
TRAFFIC SPEED (MPH)	TAPER LENGTH (Each Lane) (Feet)	DELINEATOR SPACING		SIGN SPACING (Advance of Taper & Between Signs) (Feet)
		Taper (Feet)	Tangent (Feet)	
25	150	25	50	150
30	200	30	60	200

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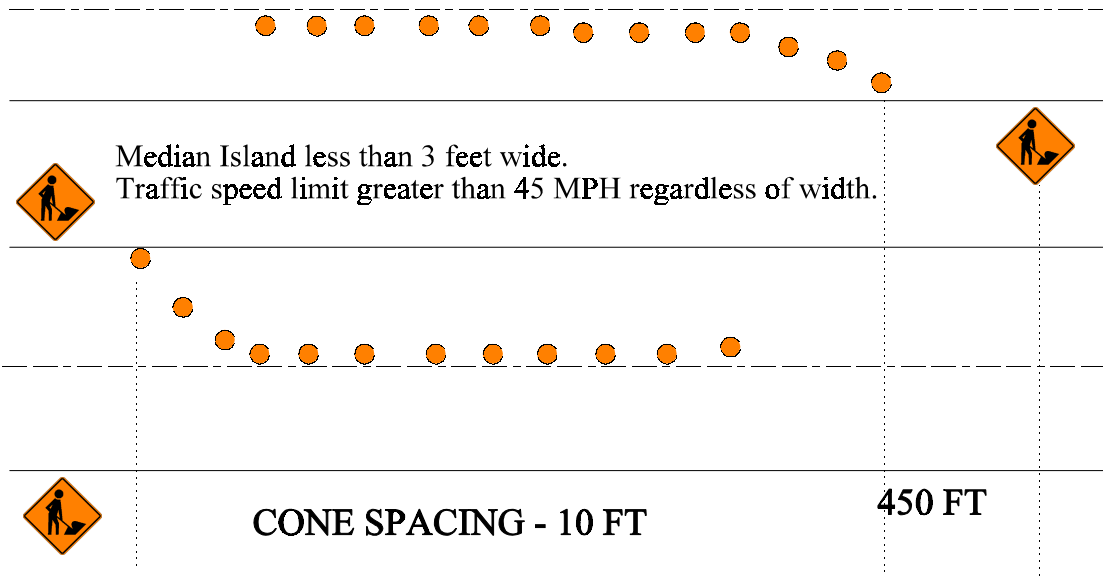
35	250	35	70	250
40	350	40	80	350
45	550	45	90	550
50	600	50	100	600
55 +	1000	50	100	1000

- (f) If the sign is placed close enough to the work area so the driver can see the work area as soon as he passes the sign, lets say 500 feet, he has only a few seconds to react. So he'll still be moving at close to 50 mph when he passes within a few feet for the workers. And if you have ever been one of those workers, you know that is too fast and too close for comfort.
- (g) But, the solution is simple. Install one sign at 1500 feet from the work area, and use an additional advance warning sign between the first sign and the work area to warn the driver again. Just be sure that the additional sign is appropriate for the situation.
- (h) On city streets where speeds are low and intersections are close, the spacing distances may be reduced to 300 feet or less. Just be sure traffic volume and sight obstructions are taken into consideration.
- (i) For high speed roadways, such as roadways, the total advance warning distance should be from 1500 feet to ½ of a mile as needed, to provide adequate advance warning and constant reminders until the work area is reached.
- (j) And on high speed expressways and freeways, where access to and from the roadway is limited, the traffic volume is generally high, the total advance warning distance should be at least ½ mile, preferably more depending on the location of the work.
- (k) The placement of channelizing devices will also vary with speed and other conditions. As speed or volume increase, the placement must be adjusted. So use the traffic speed to determine the taper length and spacing of devices (see chart above).

### A-11. SUMMARY

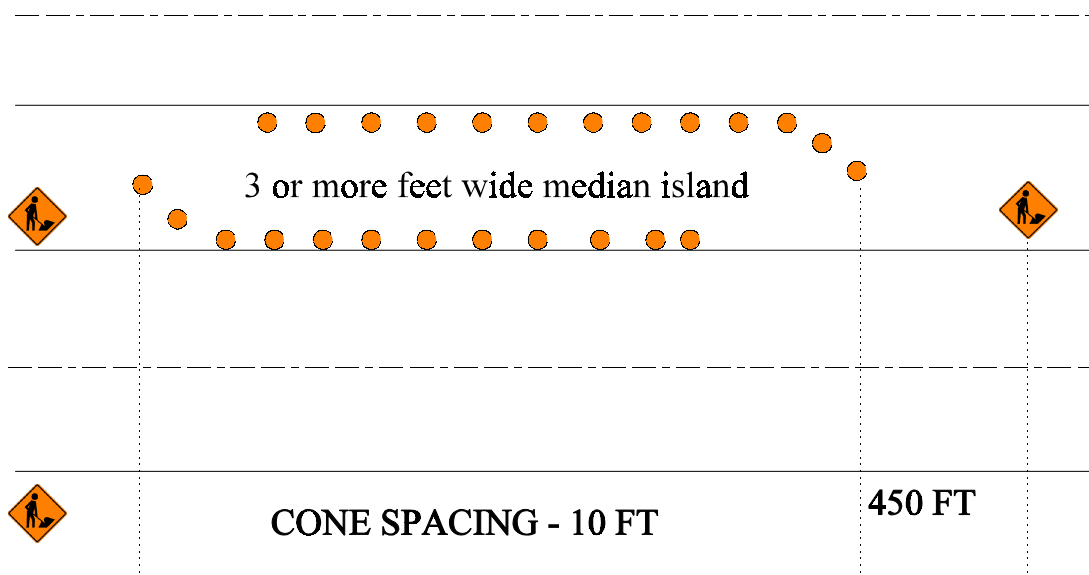
- (a) Traffic controls are the responsibility of the crew leader to establish. The primary concern is the protection of the employee and the public.
- (b) When establishing traffic controls, follow the guidance from CALTRANS and this manual.

## Median Island Traffic Controls



Setup configuration for median islands less than three feet in width or traffic speed 45 MPH or more regardless of median island width.

## Median Island Traffic Controls



Setup configuration for median islands four or more feet in width.  
Traffic speed 45 MPH or less

## Access Road Median Island Traffic Controls



Access Road

### CONE SPACING - 10 FT

Park vehicle on the access street on the side opposite from the median island.

## BACKPACK SPRAYING

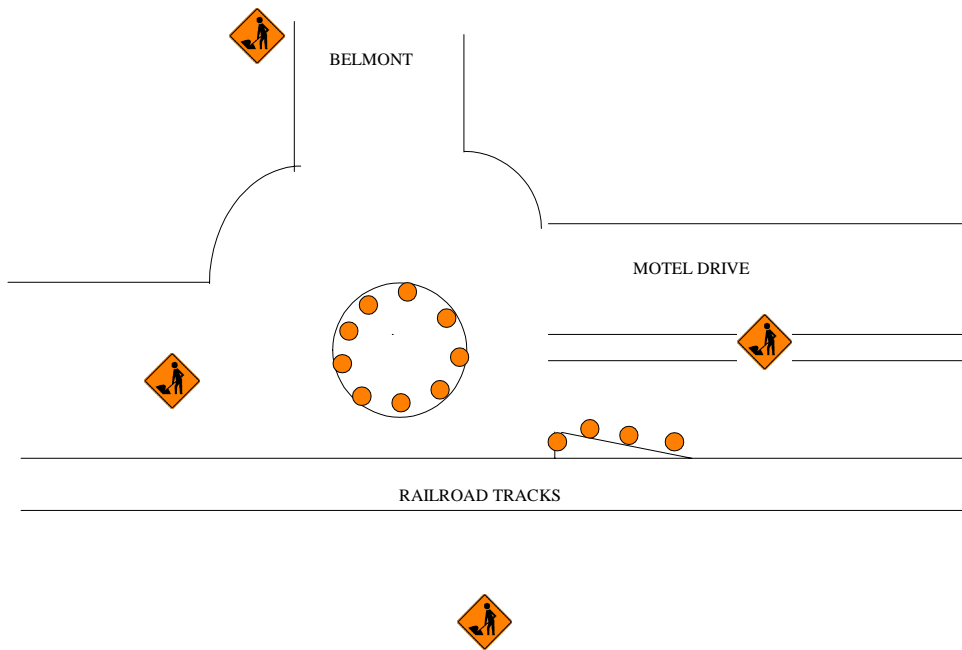


MEDIAN ISLAND

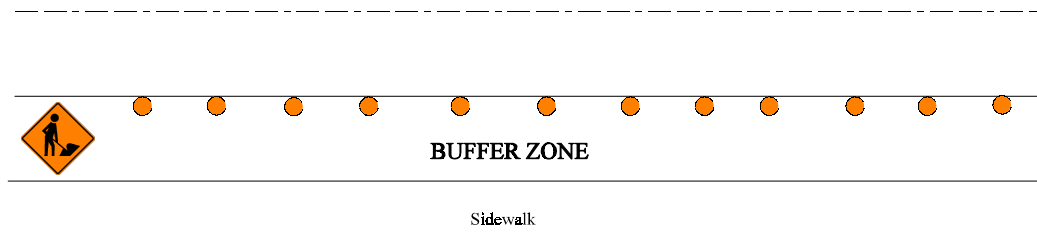


PLACE MEN WORKING SIGNS AT ½ MILE INTERVALS

## Belmont Traffic Circle Traffic Controls



## Buffer Zone Traffic Controls



### CONE SPACING - 10 FT

Park vehicle on the side of the street on the side of the buffer zone.